Glenwood Area Fisheries Newsletter

2021-2022

Spruce Creek: Trout Fishing in West Central Minnesota

A brown trout caught while casting spinners in Spruce Hill Park.

In spring of 2019 a new angling opportunity came to the Alexandria area. Spruce Creek was stocked with brown and rainbow trout within Spruce Hill Park, east of Miltona. The Viking Sportsmen have continued to stock trout each spring, with additional stocking also taking place by MN DNR. In late April 2022, 1,600 yearling rainbow trout were stocked into the stream. An additional 1,000 trout (500 rainbow and 500 brown trout) will be stocked on May 19. Past surveys have shown that most rainbow trout don't survive in Spruce Creek past mid-June, as water temperatures exceed their lethal limits. Anglers are encouraged to harvest these fish. However, brown trout are able to tolerate higher water temperatures and have survived all year, reaching lengths up to 17 inches in recent surveys. Temperature logging devices placed in the stream each year will help us continue to evaluate this unique opportunity.

Trout season is from April 16 to September 14, 2022. Anglers between the ages of 18 and 64 need a Trout Stamp to harvest trout. There is shore fishing available in Spruce Hill County Park with wadeable fishing opportunities available both up- and downstream. The possession limit is five, with only one over 16 inches. Try your luck casting a trout spinner, floating a dry fly or even dunking a worm under a bobber! Good luck!

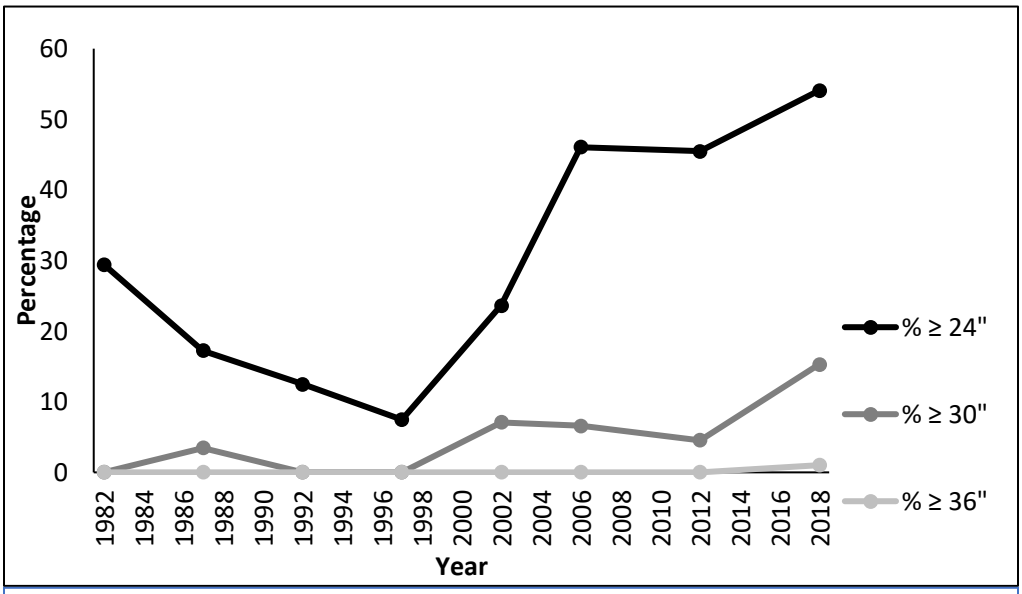
Winterkill: Dissolved Oxygen Monitoring

The winter of 2021-2022 was a hard one. The combination of a long period of ice cover and thick snow cover on lakes significantly increases the chances of winterkill. During the winter months fisheries staff monitor lakes that have been prone to winterkill in the past using a dissolved oxygen meter. If dissolved oxygen drops below 3 parts per million there is a chance that at least a partial winterkill has taken place. In those instances we conduct a survey soon after ice out and determine the extent of the winterkill so stocking can take place as needed. During the winter of 2018-2019 severe winterkills took place on Gilbert, Lightning and Lower Elk. Partial winterkills also were observed on Johanna, Westport and Charlotte. Surprisingly, in 2022 Malmedal was the only lake with a public access where winterkill was recorded. Ice out assessments on Hattie, Charlotte, Gilbert and Lower Elk revealed no winterkill had taken place and dissolved oxygen levels were good on all other lakes monitored.

Restoration of a High Quality Pike Fishery:

20 Years of Special Pike Regulations on Lake Rachel

The all too familiar scenario. A day out fishing pike, or any fish for that matter, ruined by the onslaught of small pike. Hammerhandles. Snot Rockets. Slimers. Snakes. By any name, it's all the same thing, small, skinny northern pike. These plagues of slow growing pike occur in many of our lakes, and at least they used to in Lake Rachel.



Percent of northern pike in each size category sampled on Lake Rachel from 1982 to 2018. The special regulation was implemented in 1997.

Looking back a few decades, pike regulations wouldn't be the only changes coming to Lake Rachel in the 1990s. Wet conditions during the decade caused water levels to increase drastically. Newly flooded vegetation and access to new bays and sloughs provided great spawning habitat for pike. Reproduction increased and so did overall pike abundance. From 1982 to 1992 northern pike catch rates averaged 3.7 fish per net. By 1996, prior to the regulation being implemented, northern Pike catch rates had already rose to 11.2 fish per net.

Lake Rachel was a good fit for a high quality pike population. The lake offers highly diverse habitat, from shallow, vegetated bays and flats, to steep shoreline breaks and deep mid-lake basins. Great water quality and deep basins also afford the presence of a high quality food source, tullibee. Also known as cisco, this open water fish species can be abundant and high in calories. Meaning pike that grow large enough to consume them can maintain fast growth rates and even larger sizes. However, most pike in Lake Rachel weren't reaching large enough sizes to take advantage of this prey base. Prior to the regulation, as many as 92% of pike caught in a survey were less than 24 inches long, otherwise known as "hammerhandles".

Anglers and biologists alike are all too familiar with "hammerhandle" pike in the lake rich region of central Minnesota. A lack of or loss of larger pike from a system can lead to increased survival of small pike. The result can be lakes full of small, skinny, slow growing pike. An overabundance of small pike can lead to other problems in a lake, including increased predation on small walleye and increased competition between walleye and northern pike for their preferred prey, yellow perch. The idea behind special pike regulations was to protect the few fish in the system that did grow larger and encourage the harvest of small pike. Also, large pike have been known to consume small pike and exhibit their own population control. Lower pike abundance means those remaining are likely to grow faster and have an even better chance of growing big. While the theory sounded good and Lake Rachel was a perfect candidate, would the regulation work in practice?

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In 1997 a 24-inch maximum length limit was implemented and was in place through 2007. During this time, only slight improvements in size structure were observed. Creel surveys conducted during this time showed a very modest harvest of small pike. During the special regulation evaluation in 2007, there were angler requests for the opportunity to harvest an occasional larger pike. Based on survey results and angler interest the regulation was modified to a 24- to 36-inch protected slot limit, meaning all pike within that range needed to be released. Since implementation of the modified regulation in 2008, northern pike size structure continues to improve. This was especially evident in the most recent survey. In 2018, for the first time in standard survey history, a majority (54.1%) of northern pike were greater than 24 inches long. The highest percentage of pike exceeding 30 inches (15.3%) was also documented in 2018. Since 2016, multiple pike over 36 inches have been observed in various surveys; whereas only one other pike this large has been observed in all prior surveys dating back to 1982. Even more rewarding is that angler reports of large northern pike have also been more numerous in recent years, including reports of fish up to 40" long. After 25 years of special harvest regulations, the northern pike population in Lake Rachel now offers one of the highest quality pike fisheries in the area.

Employee Spotlight: Alex Letvin

Alex Letvin joined the Glenwood office as the Fisheries Supervisor in September 2021. He is originally from Michigan where he developed a love for the outdoors at an early age. Alex attended the University of Michigan where he received a bachelor's degree in Environmental Science with a specialization in Fish and Aquatic Ecosystems. After college he spent some time working at a fish farm in Michigan and a marine science center in the Florida Keys. He also met his Minnesotan wife Kari while working in Florida. After a couple years he decided to pursue graduate studies, so he attended South Dakota State University where he earned a master's degree in Fisheries Science. His thesis research focused on common carp and their effects on food webs, energy flow, sportfish population characteristics, invertebrate densities, and water quality. This was accomplished by repeatedly sampling lakes throughout eastern South Dakota over three years, half of which contained carp while the other half did not.

Area Supervisor, Alex Letvin, with a yellowtail jack caught while fishing off the coast of California.

After completing his master's degree in 2013, Alex accepted a position with the California Department of Fish and Wildlife's Ocean Salmon Project, which is responsible for managing and monitoring the commercial and recreational salmon fisheries off the coast of California. The Pacific Ocean salmon fishery is managed by the federal government, and Alex was the scientific adviser representing the State of California. This gave Alex extensive experience working with fishing industry stakeholders and participating in high-profile contentious fishery management issues. He also led sampling crews in various California ports and performed intensive analyses including salmon stock abundance forecasts, stock rebuilding plans, harvest and spawning assessments, and statewide hatchery contribution evaluations.

Alex, his wife Kari, and their son Franklin are very happy to be back in the Midwest where they truly belong. The West Coast was fun, but they are thrilled to be closer to family and surrounded by good Midwestern folks again. They are very eager to get their boat out on the water this summer to explore the abundant lakes and incredible fishing opportunities that this area has to offer.

Quality Sunfish Initiative: Phase 2

An 11-inch territorial male bluegill caught on an area lake.

In March 2021, with public support, the Glenwood Area reduced the sunfish daily limit to 10 fish on Gilchrist, Grove, Irene, Osakis and Little Osakis, and to 5 fish on Whiskey Lake. On March 1, 2022 reduced bag limits went into effect on an additional 12 lakes in the area. Lakes with a 10 fish daily limit are: Amelia, Andrew, Blackwell, Leven, Mill, Minnewaska, Red Rock, Reno, Vermont and Villard. Lakes with a 5 fish daily limit are Moon and Round.

Why reduce the sunfish daily bag limit? There has been a trend of increasing numbers but a decrease in the size of bluegill throughout Minnesota. Studies have shown that angler harvest, especially of large males, can have significant negative effects on bluegill size. By reducing harvest, fish will live longer and reach larger sizes, while also genetically selecting for larger fish. To understand why we'll need to go over a crash course in bluegill biology. This is because genetically there are different types of male bluegill, leading to a very complicated life history.

What most people think of when targeting sunfish are territorial males or 'bulls', which put all of their energy into growing larger before maturing. This delayed maturation enables them to reach the largest sizes. They are also the only type of bluegill to build and guard nests. Competition leads to an increase in size, as territorial males compete for the best spawning areas and prevent smaller males from fertilizing eggs.

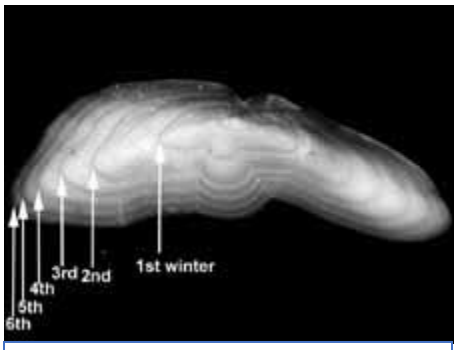
The other strategy in male sunfish is to mature early, called 'sneaker' males. Small 'sneaker' males mature as early as a few inches and because of this they grow slow. These are what many people would think of as a stunted fishery. If sneaker males can live long enough, they may become satellite males, also called 'female mimics'. As the name suggests, they look like females. Satellite males reach intermediate sizes and trick territorial males into thinking they are females so they can stealthily spawn without making or guarding nests. And depending on which type of bluegill fertilizes the eggs, this dictates what the offspring will be. So by having more 'bull' males in a lake it will increase competition for nesting sites and select for larger fish!

So why don't we just close bluegill harvest during the spawn? Recent studies on Lake Minnewaska and several other nearby lakes have shown large male bluegill often make up a greater proportion of the catch throughout the rest of the year, not just during the spawn. Local creel surveys have also shown that the highest bluegill harvest typically occurs during other periods of the year, such as late summer, and early or late ice fishing. Bluegill are also a unique fish, in that their spawning window is very long. Typically in Minnesota, bluegill start spawning in late May and will continue to spawn through July. Closing the season during the spawn would limit a lot of angling opportunities and likely not produce a desired benefit. However, on any lake, anglers can voluntarily help protect big sunfish by releasing or limiting their harvest of large sunfish, which are typically considered about eight inches or bigger.

A large group of beds from a nesting colony of sunfish.

Aging Fish: A Look into the Past

Fisheries biologists record a variety of information from fish collected during lake surveys that can include details such as species, length, sex, maturity and much more. However, one of the most important pieces of data that we collect are fish ages. You might be wondering how we estimate the age of a fish. To do this we look at what we refer to as 'aging structures'.



An otolith with 6 annuli under a microscope.

Being cold-blooded and living in a temperate climate, fish grow fast during the warm months and slow during the cold months. This can be observed in their calcified structures such as fin rays, spines and even scales, but the most dependable structure is a bone in the inner ear called an otolith. When placed under a microscope an otolith appears to have rings like a tree. Fish develop annual marks during periods of slow growth in winter, called annuli. By counting the number of annuli we can estimate how many years old a fish is. Over the course of the field season aging structures are collected and then brought back to the laboratory where we estimate the ages of those fish.

Why do we care how old fish are? Age data is used in a variety of different ways to make management decisions. We can determine growth, or length at a given age, and compare between lakes or within a lake over time. Further, fish ages can be used to evaluate stocking strategies or natural reproduction. After estimating individual fish ages, and when they hatched, we can observe if those ages correspond to a year that fry or fingerling stocking took place and which strategy is more successful. This can also be used to determine natural reproduction in years when no stocking occurs.

Fish Age and Growth: Longer Than You May Think

Fish ages and growth rates can be pretty variable from lake to lake but many people are surprised to find that it takes longer to grow a bluegill than it does a trophy whitetail buck. In the Glenwood area it takes on average 9 years for a bluegill to reach 8 inches. This really shows how hard it is to grow big bluegills and why they are important to protect! Walleye on the other hand only take 3 years on average to reach harvestable size (15 inches).

Anglers are also surprised how long fish can live. The longest lived fish in the world is the Greenland shark which has been estimated to live up to 392 years! In Minnesota it was believed that the longest lived fish species was the lake sturgeon. However, in 2018 researchers discovered bigmouth buffalo, a native species related to suckers, can live even longer. A 22 pound female caught near Pelican Rapids, Minnesota was confirmed to be 112 years old! This is the longest lived of any known freshwater fish! It's pretty hard to compete with that, but below you will find some of the oldest fish of each species sampled in the Glenwood area. Keep in mind that many times the oldest fish isn't the largest.

Species	Age (Years)	Length (Inches)	Lake
Freshwater Drum	54	22.3	Minnewaska
Walleye	23	24.8	Ida
Largemouth Bass	22	19.5	Ida
Smallmouth Bass	19	19.1	Ida
Muskellunge	17	49.1	Lobster
Channel Catfish	15	27.8	Emily
Bluegill	14	10.1	Carlos
Northern Pike	12	31.3	Rachel
Black Crappie	12	13.7	Pelican (Grant Co.)
Yellow Perch	9	11.5	Osakis

Oldest fish by species sampled in the Glenwood area, including length and lake from which they were caught.

Walleye Stocking: Fry or Fingerling?

-Adapted from an article by Craig Soupir, Waterville Fisheries Supervisor

In the last Newsletter we took up the topic of walleye fry versus fingerlings. If you missed that issue Part 1 can be found by clicking here.

Freshly hatched walleye fry ready for stocking.

We established when a lake is highly productive, winterkills, or is reclaimed, walleye fry stocking can be very successful and for low cost. So, what about when a lake is more stable, less productive, and with a more complex fish community? It is these situations that can lead to consideration of stocking fingerlings, or even not stocking walleye at all. Ok, I might have made some of you cringe at that last comment. Walleye are the state fish after all; however, walleye are not suited for all lakes and we must accept that reality up front.

The fact is, walleye fry are small at the time of stocking and fry have a long and dangerous road to travel in order to recruit into the population anglers target (typically around 15 inches, about 3 years of age). This road to recruitment includes the need to survive the stocking process, find adequate food, seek cover from predators, find and secure a proper mix of cover and feeding habitat, and to be in proper condition by fall to survive winter in Minnesota. It is these complex dynamics that interact to dictate if fry stockings are effective or if stocking larger fingerlings may be advantageous.

Walleye fry initially require microscopic zooplankton as food. In most lakes with high nutrients and low water clarity zooplankton abundance is often high in spring. This is critical for walleye fry coming from the hatchery that need to find food right away. Conversely, in lakes with low nutrients and high water clarity the zooplankton may not be abundant. This lack of food at the critical time of stocking can limit survival of walleye fry. Another issue with clearer lakes (even if only seasonally) is these lakes often support abundant panfish. Not only can there be inadequate food for walleye fry, but also the walleye themselves can quickly become food for other fish species, or compete for similar food resources. For example, high crappie abundance can really hinder walleye fry, as can high bluegill and bass abundance. Walleye fry can struggle to get through the gauntlet of predation and competition during the first year of life. These conditions are where stocking fingerling walleye may be suitable.

Walleye fingerlings stocked in Minnesota are mostly raised in natural, shallow, and highly productive lakes and ponds scattered throughout the state (rearing ponds). These rearing ponds provide the perfect conditions for high fry survival, plentiful food, and fast growth. From stocking walleye fry in May to the time of harvesting in September and October walleye have achieved 4 to 7 inches in length or greater. Thus, using a natural pond to boost survival of fry to fingerling size, and then stocking them into a lake, can eliminate part of the hard road a young walleye fry must travel relative to being stocked directly into a lake.

Walleye sampled during a survey of a fry stocked lake.

So why don't we just stock fingerlings everywhere? These larger fish are much less available and take a lot more effort, so there is much higher cost. We also stock fingerlings in much lower numbers in general. When fingerlings are used we can expect lower overall population numbers, relative to fry stocking potential.

There is also the issue of availability. To produce walleye fingerlings requires clean natural ponds. Historically, the best rearing ponds have been available following heavy winters. Winterkills clean out rearing ponds of all fish and essentially reset them.

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The reset is the trigger to produce a lot of walleye fingerlings. With climate change we are having fewer winterkills than in the past, so we don't always have the clean rearing pond capacity to produce large numbers of fingerlings. Lower capacity makes these larger fingerlings a limited commodity, or at least inconsistently available. The DNR has used means to mimic winterkill such as reclaiming ponds, but that also increases the cost to the point it is impractical.

The bottom line is fingerlings are a good option in certain lakes, but where to use them is largely determined by environmental conditions of an individual lake. Given fingerlings are more costly and less available the decision to stock fingerlings must be made with a great deal of consideration of all the history and facts of an individual lake.

Walleye Stocking:
Hatchery Operations Returned in 2021

The last two years have brought widespread changes to many aspects of our lives. Work at the Minnesota DNR was no different. One of the most notable changes was the temporary suspension of the annual walleye egg take program in 2020. This is the first time in over a century where no walleye spawn take operations occurred. With no eggs harvested, walleye fry were not available for stocking in lakes or rearing ponds in 2020.

One positive aspect of an absence of fry stocking in our lakes was an ability to evaluate walleye natural reproduction. This was a unique opportunity because some of our lakes are stocked annually, making an evaluation of natural reproduction difficult. Of the lakes sampled in fall of 2020, juvenile walleye were observed in Andrew, Big Chippewa, Mary, Minnewaska and Big Pelican. This information is important because it can give us a glimpse into the natural production potential of some of our larger lakes and can help guide future management.

In spring of 2021, Minnesota DNR approved safety protocols for the walleye egg take. Using these guidelines, we were able to harvest walleye eggs this spring. In addition to our traditional 2021 fry stocking plans, we also stocked the majority of lakes that were not stocked in 2020.

Lake	Number of Fish	Pounds of Fish
Aaron	1,908	249
Aaron*	3,360	112
Carlos	2,237	348
Cottonwood	2,569	251
Darling	1,927	327
Elk	160	80
Geneva	2,661	295
Grove	1,150	230
Ida	594	297
Irene	740	148
Latoka*	4,842	269
Le Homme Dieu	8,872	536
Le Homme Dieu*	1,000	100
Lobster	4,235	799
Mill	192	96
Miltona*	30,000	1,000
Mina (Berglins)	226	113
Minnewaska*	40,000	2,000
Moses*	3,360	112
Osakis	18,347	1,000
Osakis*	11,100	600
Oscar	891	446
Pelican	6,321	870
Rachel	2,793	285
Red Rock	7,138	519
Scandinavian	2,489	147
Smith	642	574
Turtle	2,187	147
Vermont*	1,125	150
Victoria	1,685	131
Total	164,752	12,231

*Number of walleye fingerlings stocked in 2021. *Indicates fish purchased and stocked by private citizens or sporting groups.*

Lake	Number of fry
Agnes	61,000
Ann	185,000
Barrett	422,000
Charlotte (Olson)	692,000
Devils	82,000
Emily	1,155,500
Freeborn	172,000
Gilbert	190,000
Gilchrist	209,330
Hattie	459,000
Henry	92,000
Ida	875,500
Johanna	700,000
Latoka	269,000
Lightning	540,000
Long (Douglas Co.)	100,500
Long (Stevens Co.)	310,000
Lower Elk	131,000
Malmedal	199,000
Mary	1,644,000
Miltona	2,759,000
Minnewaska	3,291,000
Moses	393,000
Mustinka Flowage	91,000
Nelson	267,000
Osakis	3,389,000
Page	340,000
Pelican (Grant Co.)	1,521,500
Perkins	517,000
Pomme de Terre	2,419,500
Reno	2,029,000
Thompson	74,000
Villard	541,000
Winona	231,000
Total	26,351,830

Number of walleye fry stocked in 2021.

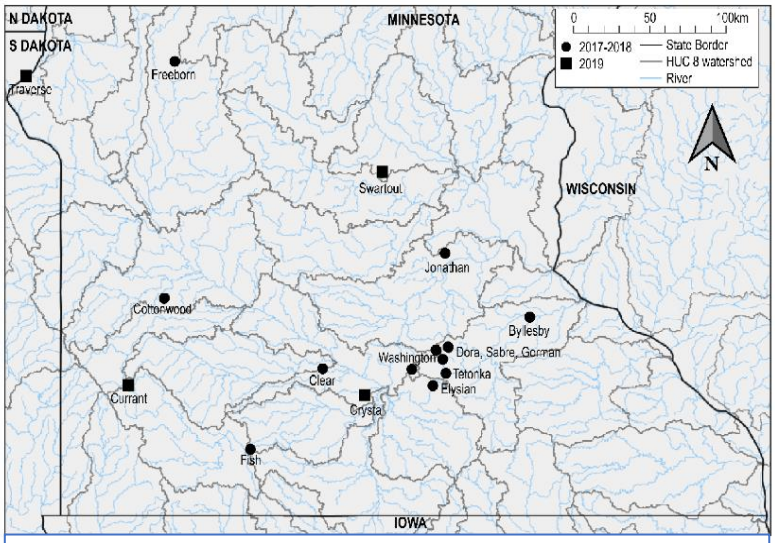
Pomme De Terre: Carp Die-Off

Thousands of dead common carp were found on the shoreline of Pomme De Terre Lake in the spring of 2020. Other nearby lakes reported similar carp-only fish kills. What would have caused common carp to die and other species escaped unscathed? Diagnostic tests were completed at the University of Minnesota to determine just that. Results indicated a virus recently discovered in Minnesota, Carp Edema Virus (CEV), was to blame.

Dead carp line the shores of Pomme de Terre Lake in Grant County after a Carp Edema Virus outbreak in spring 2020. (Photo courtesy of Isaiah Tolo)

What is CEV? Carp Edema Virus is a virus that infects common carp and koi, an ornamental relative of common carp. In general, CEV appears to occur in higher-density populations, particularly during the spawn, when fish are already experiencing high stress. Typical temperature ranges for an outbreak fall roughly between 48 and 65 degrees F. Symptoms include carp that become sluggish and unresponsive, while others may experience swelling and sunken eyes, or ulcers around the mouth and fins. During CEV outbreaks, numbers of adults killed can vary widely. Some outbreaks remove nearly all carp, while most populations experience a much lower mortality rate. Since initially documented in a 2017 fish kill in Lake Johnathan in Carver County, CEV has been attributed to over a dozen carp-only kills throughout Minnesota. Despite few reports of the virus earlier than 2017, research suggests it has likely been present, but not tested for historically.

This virus is known to infect only carp. Gamefish species have not been infected in any of the documented CEV fish kills. Consumption of fish species other than carp, even during a carp-only fish kill, could be assumed safe. Similar to other fish viruses, danger of transmission to humans is extremely low.



Location of additional CEV outbreaks in Minnesota. (Map courtesy of Isaiah Tolo)

The University of Minnesota is currently exploring the use of CEV as a potential biocontrol for non-native common carp. One of the largest obstacles for the use of CEV as a biocontrol is the fact that few CEV kills have removed more than 50% of the population. While this reduction can be beneficial, the population typically rebounds quickly in subsequent years. Additionally, it is believed survivors of the virus can develop immunity and would not be vulnerable to this virus in the future. However, it does not appear that immunity is passed to offspring, meaning CEV can continue to persist in a lake. There is much more to learn regarding this virus and its potential applications. For now, there remains many questions with its use as a biocontrol.

Please report all fish kills to the Minnesota Duty Officer (800) 422-0789, so they can be investigated.

Aquatic Invasive Species

Aquatic invasive species (AIS) continue to be a problem statewide. Over 60% of our public waters within the Glenwood Fish Management Area contain at least one AIS. Aquatic invasive species are moved from infested to non-infested waters by anglers, boaters, and lake shore owners and can adversely affect lakes and fish populations. To avoid spreading AIS, lake users are required to remove all aquatic plants or animals from their watercraft and drain all water from their boat before leaving the access. If you suspect an infestation of an invasive species in this lake, save a specimen and report it to a local natural resource office.

Zebra mussels attached to a boat lift.

In 2020, several new lakes were confirmed to contain zebra mussels. These include Aaron, Moses and Villard. In 2021 zebra mussels were confirmed in Blackwell and Leven. For a full list of lakes see the infested waters list. Additional information on AIS can be found on the DNR website (https://www.dnr.state.mn.us/invasives/ais/index.html).

Lake Surveys

Lake surveys are the primary tool for guiding fish management. Our standard lake survey consists of trap nets, gill nets and electrofishing. Electrofishing is conducted in the spring to target bass, while gill nets sample offshore fish (e.g. walleye, northern pike and yellow perch) and trap nets sample near shore panfish (e.g. bluegill and black crappie). Nets are checked and moved daily on each lake for about a week in the summer. Nets are placed in the same locations within a lake each year, and surveying over many years allows us to track trends in fish populations. Survey information can be accessed by going to https://www.dnr.state.mn.us/lakefind/index.html and typing in the lake of interest.

Standard Lake Surveys 2021

The following lakes were sampled in 2021:

Chippewa	Crooked	Devils
Elk	Latoka	Lobster
Mary	Pelican	Signalness (Mountain)
Thompson	Turtle	Whiskey
Winona		

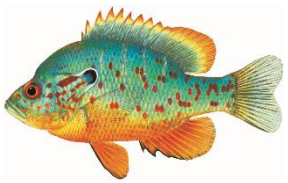
Standard Lake Surveys 2022

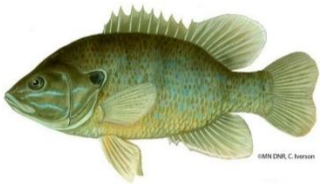
The following lakes will be sampled in 2022:

Aaron	Brophy	Moses
Oscar	Pocket	South Union
Emily	Johanna	Minnewaska
Reno	Lower Elk	Osakis
Pelican (Pope Co.)		

Glenwood Area Staff:

Alex Letvin - Area Supervisor
Bill McKibbin - Assistant Area Supervisor
Sue Mulville - Office & Admin Specialist
Chris Smith - Fisheries Specialist
Chris Uphoff - Fisheries Specialist
Nick Rydell - Fisheries Specialist
Storm Kettelhut - Fisheries/Aquatic Plant Technician
Mandy Erickson - Aquatic Plant Specialist
Lindy Ekola - Shoreland Habitat Specialist
Jeff Reed - Research Scientist
Casey Schoenebeck - Sentinel Lakes Coordinator





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